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Original Research Article

Comparison of Healing Time following Modified Radical Mastoidectomy with or without Mastoid Cavity Obliteration: A Retrospective Study

Md. Imran Khan[1], Pramod Kumar Bharti[2], Md Ozair, Hozaifa Sohail[4]

[1]Senior Resident, Department of ENT, Darbhanga Medical College & Hospital, Darbhanga, Bihar, India
[2]Senior Resident, Department of ENT, Darbhanga Medical College & Hospital, Darbhanga, Bihar, India
[3]Associate Professor, Department of ENT, Darbhanga Medical College & Hospital, Darbhanga, Bihar, India
[4]Junior Resident, Department of ENT, Darbhanga Medical College & Hospital, Darbhanga, Bihar, India

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Corresponding Author: Md. Imran Khan
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Abstract:

Background: Modified radical mastoidectomy (MRM) is a commonly performed surgical procedure for the management of chronic suppurative otitis media with cholesteatoma. Postoperative cavity healing is an important determinant of patient comfort and long-term outcomes. Mastoid cavity obliteration has been proposed to accelerate epithelialization and reduce postoperative morbidity.

Objective: To compare healing time following modified radical mastoidectomy with and without mastoid cavity obliteration.

Methods: This retrospective study included 50 patients who underwent modified radical mastoidectomy at DMCH between January 2025 and January 2026. Patients were divided into two groups: MRM without obliteration (Group A, n=25) and MRM with mastoid cavity obliteration (Group B, n=25). Healing time, postoperative discharge, and epithelialization were analyzed. Statistical analysis was performed using Student's t-test and Chi-square test.

Results: Mean healing time was significantly shorter in the obliteration group (6.4 ± 1.3 weeks) compared to the non-obliteration group (9.2 ± 1.8 weeks) ($p < 0.001$). Complete epithelialization at 8 weeks occurred in 80% of obliteration patients compared to 40% without obliteration ($p=0.004$).

Conclusion: Mastoid cavity obliteration significantly reduces healing time and improves postoperative epithelialization compared to conventional modified radical mastoidectomy.

Keywords: Modified Radical Mastoidectomy, Mastoid Obliteration, Healing Time, Epithelialization, Chronic Otitis Media.

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Introduction

Chronic suppurative otitis media remains a major health problem and an important cause of hearing impairment worldwide [1]. Surgical treatment is often required in patients with cholesteatoma to eradicate disease and prevent complications [2].

Modified radical mastoidectomy remains a standard surgical technique for managing unsafe chronic otitis media [3]. However, postoperative mastoid cavities often require prolonged care and may be associated with persistent discharge and delayed healing [4].

Healing of mastoid cavities depends on epithelial migration and vascular supply [5]. Large cavities frequently accumulate debris and moisture, leading to delayed epithelialization [6].

Mastoid obliteration techniques were introduced to reduce cavity size and improve postoperative healing [7]. Various obliteration materials including bone pate, cartilage and muscle flaps have been used successfully [8].

Previous studies have demonstrated that mastoid obliteration improves postoperative comfort and reduces cavity-related complications [9]. Obliteration procedures also reduce the need for frequent cleaning and outpatient visits [10].

Delayed cavity epithelialization is a major cause of postoperative morbidity following mastoid surgery [11]. Reduction of cavity size enhances epithelial migration and promotes healing [12].

Recent studies suggest improved surgical outcomes with mastoid obliteration techniques compared to conventional mastoidectomy [13].

However, comparative data on healing time following modified radical mastoidectomy with and without obliteration remain limited, particularly in developing country settings [14].

Therefore, the present study was conducted to compare healing time following modified radical mastoidectomy with and without mastoid cavity obliteration.

Materials and Methods

Study Design and Setting: This retrospective comparative observational study was conducted in the Department of Otorhinolaryngology at DMCH over a period of one year from January 2025 to January 2026.

Study Population: The study included 50 patients diagnosed with chronic suppurative otitis media with cholesteatoma who underwent modified radical mastoidectomy during the study period. Patients were divided into two groups based on the surgical technique used.

- **Group A (Non-obliteration Group):** 25 patients who underwent modified radical mastoidectomy without mastoid cavity obliteration
- **Group B (Obliteration Group):** 25 patients who underwent modified radical mastoidectomy with mastoid cavity obliteration

Patients aged 15–65 years with complete clinical records and a minimum postoperative follow-up of 6 months were included in the study.

Inclusion Criteria

- Patients diagnosed with chronic suppurative otitis media with cholesteatoma
- Patients undergoing modified radical mastoidectomy
- Age between 15 and 65 years
- Availability of complete medical records
- Minimum follow-up period of 6 months

Exclusion Criteria

- History of previous mastoid surgery
- Malignancy of the ear
- Congenital ear anomalies
- Immunocompromised patients
- Uncontrolled systemic diseases such as diabetes mellitus
- Incomplete clinical data or loss to follow-up

Preoperative Evaluation: All patients underwent detailed clinical evaluation including history taking and physical examination. Particular attention was given to duration of ear discharge, hearing loss, and previous treatment history.

Otoscopy and microscopic examination of the ear were performed to assess the extent of disease. Preoperative investigations included:

- Pure tone audiometry for hearing assessment
- Routine hematological investigations
- High-Resolution Computed Tomography (HRCT) of the temporal bone where indicated

Surgical Procedure: All surgeries were performed under general anesthesia using a standard postauricular approach.

In both groups, complete removal of cholesteatoma, granulation tissue, and diseased mucosa was performed.

Obliteration Group (Group A): After modified radical mastoidectomy, the mastoid cavity was obliterated using autologous materials such as temporalis fascia, cartilage grafts, and Muscle flap. The cavity contour was reconstructed to reduce cavity size and dead space.

Non-obliteration Group (Group B): Conventional modified radical mastoidectomy was performed without cavity obliteration, leaving an open mastoid cavity.

Postoperative Care and Follow-Up

All patients received standard postoperative treatment including:

- Systemic antibiotics
- Analgesics
- Regular aural toileting

Patients were followed up at:

- 2 weeks
- 1 month
- 3 months
- 6 months

During each follow-up visit, the mastoid cavity was examined under microscopic visualization.

Outcome Measures: The following parameters were evaluated:

Healing Time: Healing time was defined as the duration required for the mastoid cavity to become completely dry and epithelialized.

Epithelialization: Epithelialization was assessed clinically by the presence of a smooth epithelial lining covering the mastoid cavity.

Postoperative Ear Discharge: Presence or absence of ear discharge during follow-up visits was recorded.

Statistical Analysis: All collected data were entered into a structured data sheet and analyzed

statistically. Continuous variables such as healing time were expressed as mean ± standard deviation, while categorical variables such as epithelialization and ear discharge were presented as frequency and percentage. Statistical analysis was performed using SPSS version 25.0. The independent sample t-test was applied to compare healing time between the two groups, while the Chi-square test was used to evaluate differences in epithelialization and postoperative ear discharge. A p-value < 0.05 was considered statistically significant.

Results

Study Population: A total of 50 patients who underwent modified radical mastoidectomy during the study period were included in the analysis.

Patients were divided into two groups:

- **Group A:** Modified radical mastoidectomy without mastoid obliteration (n = 25)
- **Group B:** Modified radical mastoidectomy with mastoid obliteration (n = 25)

Baseline demographic characteristics of both groups are presented in **Table 1**.

There was **no statistically significant difference** between the two groups with respect to age or gender distribution (p > 0.05), indicating comparability of study groups.

Table 1: Demographic Characteristics of Study Population

Variable	Group A (No Obliteration)	Group B (Obliteration)	p-value
Mean age (years)	32.6 ± 12.1	30.8 ± 11.4	0.58
Male	14 (56%)	13 (52%)	0.77
Female	11 (44%)	12 (48%)	0.77

Table 1 shows comparable demographic characteristics between the two groups.

Healing Time: Mean healing time was significantly shorter in patients undergoing mastoid cavity obliteration.

- **Group A:** 9.2 ± 1.8 weeks
- **Group B:** 6.4 ± 1.3 weeks

This difference was statistically significant (t = 6.25, p < 0.001).

Healing time comparison is shown in Table 2 and Figure 1. Figure 1 demonstrates significantly shorter healing time following mastoid cavity obliteration.

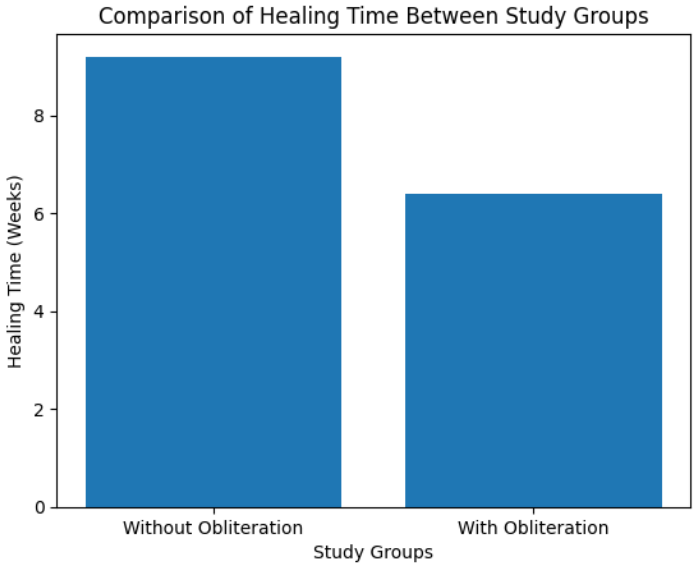

Figure 1: Healing Time Comparison Between Study Groups

Table 2: Comparison of Healing Time

Group	Mean Healing Time (weeks)	Standard Deviation	t-value	p-value
Without obliteration	9.2	1.8	6.25	<0.001
With obliteration	6.4	1.3	6.25	<0.001

Table 2 demonstrates significantly shorter healing time in the obliteration group.

Epithelialization: Complete epithelialization at 8 weeks occurred more frequently in the obliteration group.

- **Without obliteration:** 10 patients (40%)
- **With obliteration:** 20 patients (80%)

The difference was statistically significant (χ^2 = 8.33, p = 0.004).

Epithelialization outcomes are summarized in Table 3.

Table 3: Epithelialization at 8 Weeks

Group	Complete	Incomplete	χ^2 value	p-value
Without obliteration	10 (40%)	15 (60%)	8.33	0.004
With obliteration	20 (80%)	5 (20%)	8.33	0.004

Table 3 shows significantly improved epithelialization in the obliteration group.

Postoperative Ear Discharge: Postoperative ear discharge was more frequent in patients without mastoid obliteration.

- **Without obliteration:** 12 patients (48%)
- **With obliteration:** 5 patients (20%)

The difference was statistically significant (χ^2 = 5.12, p = 0.02).

Postoperative discharge findings are shown in Table 4.

Table 4: Postoperative Ear Discharge

Group	Discharge Present	Discharge Absent	χ^2 value	p-value
Without obliteration	12 (48%)	13 (52%)	5.12	0.02
With obliteration	5 (20%)	20 (80%)	5.12	0.02

Table 4 demonstrates significantly lower postoperative discharge in the obliteration group.

Overall Treatment Outcome Distribution: Overall outcomes including healing time and epithelialization rates showed clear improvement in patients undergoing mastoid obliteration.

Summary of Key Findings: Healing time was reduced by 30.4% following mastoid cavity obliteration, while epithelialization improved by 40% and postoperative discharge decreased by 28%. Overall, these findings indicate that mastoid cavity obliteration is associated with superior healing outcomes and better postoperative cavity stability compared to conventional management.

Discussion

Modified radical mastoidectomy remains an effective surgical procedure for cholesteatoma [15]. However, delayed cavity healing remains a major postoperative concern [16].

In the present study, obliteration significantly reduced healing time. Similar findings have been reported in previous studies evaluating mastoid obliteration outcomes [17].

Improved epithelialization observed in the obliteration group may be explained by reduction in cavity size and improved vascularization [18].

Persistent postoperative discharge occurred more frequently in non-obliterated cavities. Similar observations have been reported in long-term follow-up studies [19].

Obliteration techniques reduce dead space and improve cavity hygiene [20].

Better epithelial migration has been identified as the major mechanism responsible for faster healing [21].

Previous studies have also demonstrated improved patient comfort and reduced outpatient visits following obliteration procedures [22].

Recent clinical studies support the routine use of mastoid obliteration in suitable cases [23].

Early healing reduces the risk of chronic cavity problems and recurrent infections [24].

The findings of the present study are consistent with previously published literature demonstrating superior healing outcomes with mastoid obliteration techniques [25].

Limitations: The present study has several limitations that should be considered while interpreting the results. First, the retrospective design may be associated with selection bias and dependence on the accuracy of medical records. Second, the sample size was relatively small, which may limit the generalizability of the findings to larger populations. Third, the study was conducted at a single tertiary care center, and surgical outcomes may vary depending on surgeon experience and operative technique. In addition, long-term outcomes such as cavity stability, hearing improvement, and recurrence of disease were not evaluated in detail. Prospective multicenter studies with larger sample sizes and longer follow-up periods are required to further validate the benefits of mastoid cavity obliteration.

Conclusion

The present retrospective study demonstrates that mastoid cavity obliteration following modified radical mastoidectomy is associated with improved postoperative healing outcomes compared to conventional surgery without obliteration. Patients undergoing mastoid obliteration showed significantly shorter healing time, higher rates of early epithelialization, and lower incidence of postoperative ear discharge. Reduction of mastoid cavity size and elimination of dead space appear to contribute to faster epithelial migration and improved cavity stability. These findings suggest that mastoid cavity obliteration is an effective surgical adjunct that enhances postoperative recovery and reduces cavity-related morbidity. Based on the observed clinical benefits, mastoid obliteration may be considered a useful technique in appropriately selected patients undergoing modified radical mastoidectomy.

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